

REMARKS

Reconsideration of the subject application in view of the present amendment is respectfully requested.

The rejections of claims in view of the patent to Chandler (U.S. Patent No. 6,093,150), either alone or in combination with either the patent to Lang (U.S. Patent No. 5,941,825) or the patent to Vilkomerson (U.S. Patent No. 5,669,388), are respectfully traversed.

It should be noted that to aid in the understanding of the distinctions between the present invention and the Chandler patent, alone or in combination with the Lang patent or the Vilkomerson patent, the claims have been amended.

It would be beneficial to first understand the devices that are disclosed within the cited patents before discussing the shortfalls of the cited patents.

The Chandler patent discloses an ultrasonic imaging device for imaging the middle and inner ear. As is to be expected with any imaging device, a plurality of image points or pixels are taken together to form the image. Within the Chandler device, a flexible "L" shaped probe has an array of imaging transducers that generate the plurality of pixels that provide the image. The Chandler patent does not disclose, teach or suggest calculation of fluid viscosity, or its relationship to ear disorders, based on a received ultrasonic signal. Also, Chandler does not disclose, teach or suggest the use of only one transducer.

The Chandler patent discloses that the array can either be fixed or movable. Specifically, the Chandler patent discloses that the array is movable as a whole. The Chandler patent does not disclose, teach or suggest that the individual transducers are individually movable within the array. The Chandler patent discloses that the transducers of the array are oriented along a direction, but that the direction of the array may be changed (see Figs. 2a-2c). Specifically, the brief description of these figures states that the array is moved into various different elevational positions.

It should be noted that the Chandler patent does not disclose, teach or suggest that the array of the Chandler device would have an array face curvature as suggested by the Office action, at page 3. The teachings provided from the referenced portion of the top of col. 7 of the Chandler patent are not properly set forth by the Office action. Specifically, the top of col. 7 states that the array may either be fixed or the elevation angle of the array may be adjusted. The adjustment of the array permits a movement to and fro that is termed fanning. The top of col. 7 does not teach that the array face can be curved. If there is some continued confusion, attention should be directed to the details of the sentence structure at the cited portion of col. 7. The elevation angle is presented in the singular form and is not presented in the plural form. As such, it is clear that the referenced elevation angle is of the imaging array. It is also clear that since the elevation angle is not presented in the plural, the reference is not to plural, different angles that would be associated with the plural, different transducers within the array.

The Lang patent is directed to a body fat measuring device. The Lang device does disclose that it is good to move a single transducer to at least two different positions so that a determination can be made as to which transducer signal proceeded along the most direct path through the body fat.

The Vilkomerson patent discloses a method of externally locating a blood vessel via the use of a plurality of transducers that are placed upon the skin. Only one transducer will return an echo that indicates the blood vessel being located thereat.

Turning to the claims that were rejected in view of the Chandler patent alone, the Chandler patent does not have the claim-specified limitations.

Independent claim 14, recites, in pertinent part, that the apparatus is for detecting an ear disorder without imaging the ear. The Chandler device is an imaging device. It is unarguable that the Chandler device is worthless unless an image is produced.

Further, independent claim 14, recites, in pertinent part, that the apparatus has a plurality of transducers, with each transducer being operable to transceive a

signal for ear disorder detection. Within the Chandler device, each individual signal from the respective individual transducer cannot provide for detection of an ear disorder. At best, each transducer of the Chandler device operates to provide one pixel of an image.

Still further, independent claim 14, recites, in pertinent part, that the apparatus has means for supporting the transducers in an array to interact with an ear, with each transducer being fixedly oriented along a different direction for interacting with a different ear portion during operation. Within the Chandler device, at best, the entire array can be moved or fanned to and fro. As is discussed in detail above within regard to the disclosure of the Chandler patent, nothing within the Chandler patent is directed to fixing the plural transducers within an array to have different orientation directions.

As such, claim 14 is allowable for these reasons.

Independent claim 23 recites, in pertinent part, that the apparatus is for detecting an ear disorder, each transducer is operable to transceive a signal for ear disorder detection, and the apparatus includes means for detecting the ear disorder using only one received signal. As is similarly discussed above for claim 14, in the Chandler device, each individual signal from the respective individual transducer cannot provide for detection of an ear disorder. At best, each transducer of the Chandler device operates to provide one image pixel. A single pixel is not useable to detect ear disorder based upon the teachings from the Chandler patent.

Further, independent claim 23, recites, in pertinent part, that the apparatus includes means for supporting the transducers in a curved array. As is similarly discussed above for claim 14, in the Chandler device, at best, the entire array can be moved or fanned to and fro. As is discussed in detail above within regard to the disclosure of the Chandler patent, nothing within the Chandler patent is directed to the transducers being within a curved array. As is clearly presented throughout the entire Chandler patent, the array is flat.

As such, claim 23 is allowable for these reasons.

Independent claim 35 recites, in pertinent part, that the method includes determining the existence of an ear disorder using the information to determine middle ear effusion without ear imaging. As is clear, the Chandler device cannot be operated to provide such claimed methodology. As such, claim 35 is allowable.

Independent claim 43 recites, in pertinent part, that the method includes providing a probe that includes a plurality of transducers arranged in an array, which is curved in a first plane and which is curved in a second plane transverse to the first plane. As mentioned above with regard to claims 14 and 23, the Chandler device does not have transducers fixed such that the directions are different and specifically the array is not curved. Claim 43 goes further by stating that curvatures are present in two transverse planes. Absolutely nothing within the Chandler patent even comes close to such structure. As such, claim 35 is allowable.

Turning to the claims that were rejected in view of the Chandler patent in an asserted combination with the Lang patent or the Vilkomerson patent, it is respectfully submitted that it would not have been obvious to a person of ordinary skill in the art to modify the Chandler device in view of teachings from either the Lang patent or the Vilkomerson patent.

First, with regard to an asserted modification of Chandler in view of Lang, the Office action seems to present the position that the ultrasound-skilled diagnostician would want to forgo the very information-laden imagery provided by the signals of the plural transducers of the Chandler device so that only a single transducer is selected and used. As can easily be understood, the single transducer is going to provide a single bit of information (i.e., one distance measurement). It is respectfully submitted that the person of ordinary skill in the art is not going to destroy the invention of Chandler to get less information.

The Office action attempts to rationalize the loss of the information-laden imagery by stating that validity is not obtainable if the Chandler array is at a slant. However, the Office action fails to appreciate two aspects. First, slanting is not an issue because the Chandler device is an imagery device and an image is still produced regardless of slant. Second, if slanting is an issue, the Chandler device

already accommodates such an issue because the array of the Chandler device can be moved as a unit. As discussed at the top of Col. 7 of the Chandler patent, such movement of the array provides for better imaging. More important, the information-laden imagery is still provided. So, the proposal to destroy the imaging capability of the Chandler device would certainly not make any sense to a person of ordinary skill in the art.

Second, with regard to an asserted modification of Chandler in view of Vilkomerson, again the Office action seems to present the position that the ultrasound-skilled diagnostician would want to forgo the very information-laden imagery provided by the signals of the plural transducers of the Chandler device so that only a single transducer is selected and used. Again, as can easily be understood, the single transducer is going to provide a single bit of information (i.e., the one signal has the greatest strength). It is respectfully submitted that the person of ordinary skill in the art is not going to destroy the invention of Chandler to get less information.

The Office action attempts to rationalize the loss of all of the information-laden imagery by a cryptic statement concerning the Vilkomerson patent providing for the avoidance of artifact and to assess blood flow with validity by genuinely overlying the blood vessel of interest. This seems to be plain nonsense. Further, selecting one signal from one transducer based upon strength because of overlying on a blood vessel will not give a greater amount of information than the information-laden image that Chandler already provides. So, the proposal to destroy the imaging capability of the Chandler device would certainly not make any sense to a person of ordinary skill in the art.

Accordingly the person of ordinary skill in the art would not have been motivated to modify the Chandler device in view of teachings from either the Lang patent or the Vilkomerson patent.

Also, assuming, *arguendo*, that either of such proposed modifications to the Chandler device were to be done, the resulting combination device would not have the claim-specified limitations.

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With regard to the combination that includes the Lang patent, even if the single signal from the single transducer is selected, the signal would presumably be associated with the shortest distance between the transducer and the ear surface. The person of ordinary skill in the art is not going to be able to determine any ear disorder based upon a determination that a distance is the shortest. Moreover, the distance determination is a relative determination that is based upon the placement of the sensor relative to the ear surface. When the sensor is closer to the ear surface, the distance is shorter and vice versa. Does this indicate an ear disorder? The clear answer is - NO.


With regard to the combination that includes the Vilkomerson patent, even if the single signal from the single transducer is selected, it would presumably be associated with a blood vessel in the ear. The person of ordinary skill in the art is not going to be able to determine any ear disorder based upon locating an ear blood vessel.

Turning to specifics, claims 1 and 31 each recite, in pertinent part, that the apparatus has means for detecting the ear disorder using the signal determined as providing an accurate indication of the detected ear disorder. In both of the asserted modifications, the single signal cannot indicate an ear disorder.

The dependent claims contain additional limitations that are not obvious and could not even be provided by the cited references. As such, it is not necessary to discuss these claims further.

If there are any fees required by this communication, please charge such fees to our Deposit Account No.: 16-0820, Order No. 34968US3.

Respectfully submitted,
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